wherein said rotor is formed of a plurality of longitudinal segments of permanent magnetic material, wherein said segments alternate orientation of north-south magnetic polarity in a radial direction to produce flux in flux path loops connecting pairs of the longitudinal segments;

a plurality of stator coils mounted on said shaft for receiving current from an external power supply that commutates current in said stator coils;

wherein said motor is a brushless d.c. motor;

further comprising a cylindrical metal housing forming a part of the rotor for receiving the segments of permanent magnetic material and for supporting the shaft and the stator coils in a motor assembly;

wherein said motor assembly is disposed inside of and secured to said roller with a contact fit;

wherein said motor is supported by two spaced apart bearings which space the rotor from the stator to form an air gap; and

wherein one of said bearings is proximate one end of the conveyor roller and wherein the other of said bearings is disposed part way along the length of said conveyor roller.

14. (New) The motor of claim 13, further comprising a third bearing disposed at an end of the conveyor roller opposite the bearing proximate to one end of the conveyor roller.

15. (New) The motor of claim 13 or 14, wherein said rotor is connected to directly drive said roller without the use of a reduction gear assembly.

16. (New) The motor of claims 13 or 14, wherein the housing contacts the conveyor roller with a force fit.

17. (New) The motor of claim 13 or 14, wherein said plurality of poles includes at least six poles formed in said cylindrical member as longitudinal segments with segments of alternating north-south magnetic polarity with said roller providing a magnetic path between segments.

B' cancel'd.

18. (New) The motor of claim 13 or 14, wherein the stator coils are formed of a number of turns and a gauge of wire selected to produce a ratio of stator voltage to speed of at least 10 RMS volts per 1000 RPM for an applied stator voltage of 24 RMS volts per phase.

19. (New) The motor of claim 13 or 14, wherein the stator has a plurality of teeth, and wherein each stator coil encircles a single stator tooth.

20. (New) The motor of claim 13 or 14, further comprising a position sensor for detecting a rotational position of the rotor.

21. (New) The motor of claim 20, wherein the position sensor comprises three Hall-effect devices mounted on a circuit board disposed within the motor housing.

22. (New) The motor of claim 20, in combination with an electronic controller, said electronic controller sensing rotational position of the rotor from the position sensor and controlling commutation of current supplied to the stator coils.

Remarks

In the Office Action of May 31, 2002, the claims were rejected under 35 U.S.C. §103 (a) as being unpatentable over various combinations of Syverson, U.S. Pat. No. 5,918,728; DeFillipis, U.S. Pat. No. 5,233,250; Shiba, U.S. Pat. No. 5,524,805; and von der Heide, U.S. Pat. No. 4,882,511.

In view of the various items of art cited in the Office Action, the claims have been redrafted and presented as claims 13-20 to emphasize the distinctions of the invention over the collective prior art.

Claim 13 recites the features wherein the motor housing is disposed in the conveyor roller with a contact fit. Claim